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PART I.

THE STUDY OF THE CUPOLA.

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At the present time, when so much is said and written about foundry matters, a little more attention should be directed to the practical applications of the Cupola, for the majority of foundries must depend upon uneducated cupola tenders for their success in this line of work.

While it is of the greatest benefit to know all about the scientific methods of making mixtures, yet there are many practical points about a cupola which do not come under the control of the chemist, but which none the less demand an equally careful consideration.

Beginning with the regular morning chipping and daubing up the lining of the cupola, preparatory to charging it, it may be stated that the men entrusted with these operations usually know very little of the why and wherefore of the work, for I have often seen the diameter of the lining across the top of the tuyeres two to

three inches larger than across the bottom, thus causing the iron when melted and dripping down to run into the tuyeres and eventually choke them up.

Had the cupola tender been taught to bridge the top of the tuyeres, and always keep them that way, the bad results coming from this trouble would many times be done away entirely.

In chipping and daubing up the other parts of the cupola which may require attention, I have often seen men use picks or other similar weapons, the result being the coming away of large portions of the lining. In finally repairing these places it may be found necessary to reline half way up, at a cost of possibly 50 dollars. Had the man been properly instructed, much of this expense would have been avoided.

I know from practical experience that equal proportions of Kaolin and Molding Sand, mixed with clay-wash, forms an excellent daubing material, and makes the chipping of the cupola simple and safe, thereby insuring a longer life to the lining. After chipping, apply this material in the form of a thick paste all around from the bottom as far as a man can reach above the melting zone. After putting the bottom plates up and securing them with the bar, take a mixture of old sand, as coarse as possible, and properly tempered to avoid steam and blisters, ram in about nine or ten inches deep, keeping it highest around the walls of the cupola, inclining slightly downward to the tapping hole, and wash over with coke facing or any cheap mineral mixed like black wash.

In following the above method of making the bed, many run-outs may be avoided by those who have this trouble.

Now take a $1\frac{1}{4}$ " pin for the tapping hole, ram up around it with Kaolin only, keeping the pin on the same angle with the bed. Place some oily waste on the bottom, carefully insert the wood so that none of the logs will destroy the bottom, and after this has been all put in the point is reached where the fuel is added, and the chemist can take charge.